# EVALUATION OF A TREATMENT PACKAGE TO REDUCE RAPID EATING

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We replicated and extended treatment procedures described by Lennox, Miltenberger, and Donnelly (1987) designed to reduce rapid eating. The participant was a 17-year-old girl with developmental disabilities who engaged in dangerously high rates of food ingestion. The procedure involved an adjusting differential-reinforcement-of-low-rate-responding (DRL) schedule, response blocking, and prompts. We evaluated a continuation of the treatment despite initial negative side effects that were similar to those reported by Lennox et al. Results showed that the treatment package was effective and negative side effects eventually decreased.

DESCRIPTORS:    differential reinforcement of low-rate responding, rapid eating

Behavioral interventions have been effective in treating a variety of feeding disorders (e.g., Kahng, Tarbox, & Wilke, 2001). Less research has focused on decreasing the rate of food intake. Lennox, Miltenberger, and Donnelly (1987) provided one such demonstration designed to reduce the rate of rapid eating in 3 individuals who had been diagnosed with mental retardation. The authors compared a fixed-interval (FI) schedule, during which all eating responses attempted prior to the completion of the interval were blocked, to a differential-reinforcement-of-low-rate-responding (DRL) procedure in which early response attempts were blocked and resulted in the interval being reset. Eventually, DRL with prompts was introduced in which the therapist blocked early attempts and provided verbal prompts. Results showed that the DRL schedule with prompts was the most effective in increasing the interresponse time (IRT) to the target level (15 s). Lennox et al. also reported increased rates of problem behavior for 1 par-

ticipant, which resulted in the termination of the procedure.

The purpose of the current investigation was to replicate and extend the procedures described by Lennox et al. (1987) with a hospitalized 17-year-old girl whose rate of eating was dangerously high. We extended the previous methods by implementing an adjusting DRL rather than a fixed DRL schedule. Finally, we evaluated continuation of the treatment despite initial negative side effects that were similar to those reported by Lennox et al.

## METHOD

### Participant, Setting, and Data Collection

The participant was Millie, a 17-year-old girl who had been diagnosed with profound mental retardation. She had also been diagnosed with cerebral palsy, which caused difficulty in the use of her arms as well as in her ability to chew food and swallow liquids. She was able to eat independently, but because of the difficulty she had with chewing, her food was prepared as "soft-mechanical," a consistency between finely chopped and pureed. During her admission in the hospital, she was monitored during all mealtimes because her mother had warned about prob-

lems with choking and rapid eating. Prior to this study, hospital staff were asked to block eating if Millie began to eat too fast.

Sessions were conducted during two of Millie's regularly scheduled meals per day, 5 days per week, in a therapy room containing a table and chairs. The meal was completed when Millie had eaten all of the food on her plate or walked away from the table. Typically, these sessions lasted between 10 and 20 min. The maximum duration of data collection during treatment was 20 min (although Millie was always allowed to finish her meal and the protocol remained in effect). Session durations were longer in treatment than in baseline because of blocked responses and eventually longer IRTs. Data were collected on bites, bite attempts, self-injurious behavior (SIB), and tantrums. *Bites* were defined as food allowed into the mouth, and *bite attempts* were defined as the eating utensil or the hand scooping the food on the plate coupled with movement toward the mouth; *SIB* included hand biting (closing of the teeth to the skin) and heel-to-shin contact; *tantrums* were defined as screaming and crying. All measures were converted to responses per minute except tantrums, which were evaluated with a duration measure. Observers were seated behind a one-way window and collected data on laptop computers. Interobserver agreement was calculated by dividing the sessions into 60 10-s intervals. The frequency of a target behavior scored by one observer was compared to the frequency (or duration for tantrums) observed by the second observer by dividing the smaller number by the larger number (in each interval), and converting to a percent-age. The mean percentage was then used as an overall score. Interobserver agreement was recorded during 17% of the sessions. The mean agreement was 93%, 89%, 96%, and 98% for bite attempts, bites, SIB, and tantrums, respectively.

*Procedure*

During baseline, the participant was allowed to take bites of food without interference. A therapist was in the room at all times to watch for choking, and a nurse practitioner was nearby in case of an emergency. The treatment condition was designed initially with a 15-s DRL. The DRL length was selected through medical consultation and was based on the interval established by Lennox et al. (1987). The participant was seated at a table, and the plate of food was placed in front of her. The therapist stood behind the participant within arm's length. The timer was set when the participant took a bite of food. The 15-s interval was signaled via a beeping timer, and the timer was reset contingent on any attempts to take a bite of food before the timer sounded. All attempts to take a bite prior to the timer beep were blocked by the therapist (Lennox et al.), and Millie was physically guided to place the eating utensil on the table and to place her hand in her lap. All SIB and tantrums resulted in no programmed consequences. Because the initial DRL 15-s interval resulted in low rates of reinforced responses (bites) and high rates of blocked responses, an adjusting DRL was introduced. During the adjusting DRL, the interval for each session was determined by calculating the average IRT of the previous five sessions. If the mean

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Figure 1. Top panel: IRT in seconds between bites across baseline and adjusting DRL conditions. Second panel: number of bites allowed (filled circles) and attempted (open circles) across baseline and adjusting DRL conditions. Third panel: percentage of bites resulting in access to food across adjusting DRL condition. Bottom panel: number of responses per minute of SIB (filled circles) and percentage of session with tantrums (open squares) across baseline and adjusting DRL conditions.
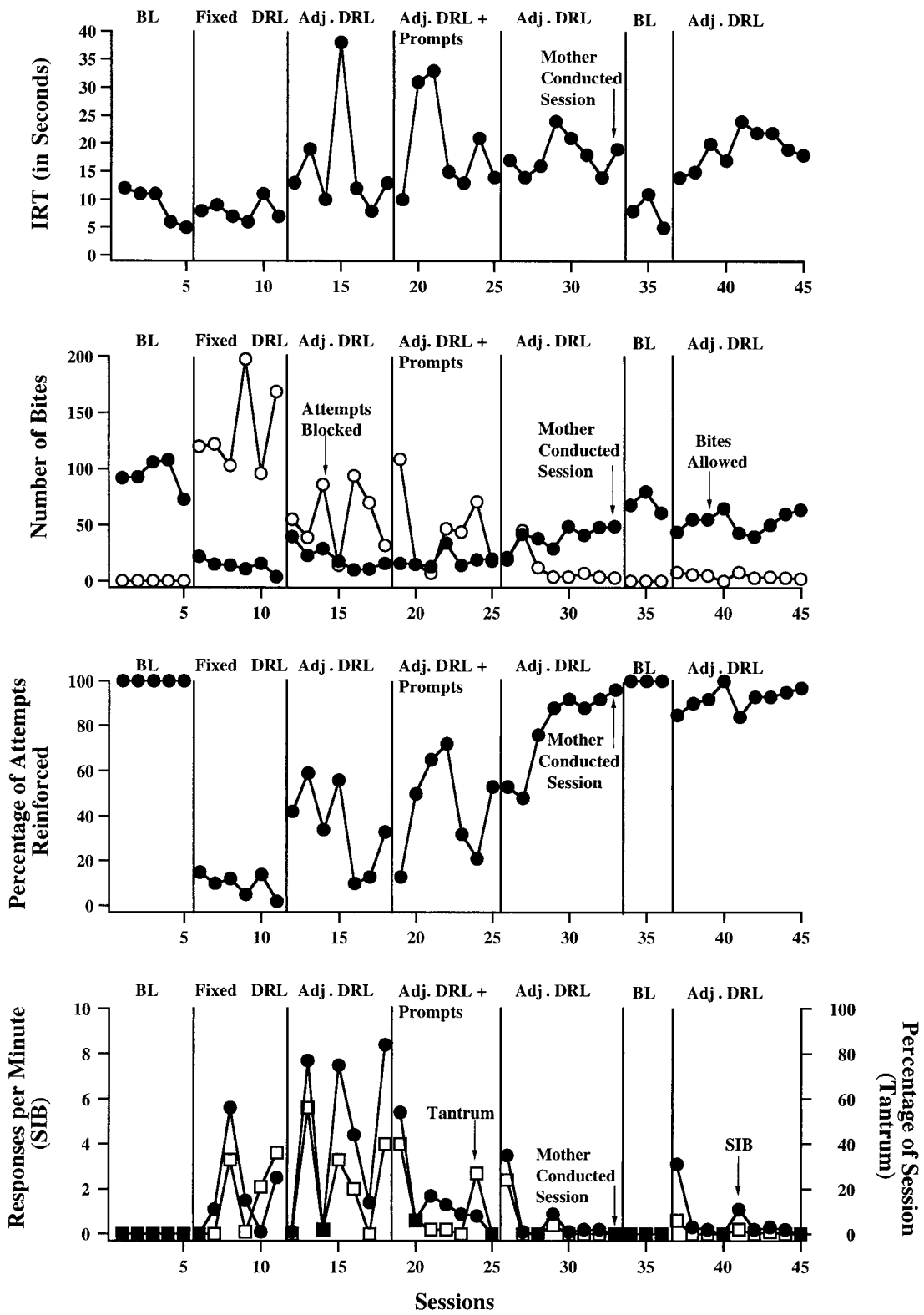
IRT was calculated to be greater than 15 s, the IRT was set at 15 s. The timer signal remained in effect during the adjusting DRL. During Sessions 19 through 25, the prompt "eat slowly" was introduced following each bite. The effects of the treatment package (adjusting DRL, response blocking, and prompts) were evaluated using an A-B-C-(C+D)-C-A-C design, in which A was baseline, B was fixed DRL, C was adjusting DRL, and D was prompts.

## RESULTS

Figure 1 (top panel) shows the IRT (in seconds) for the baseline and treatment conditions. The IRT during baseline conditions was consistently below 15 s ($M = 8.6$ s). During the fixed DRL condition, the IRT was below 15 s until the adjusting DRL was implemented (Session 12). Following the implementation of the adjusting DRL, the IRT gradually increased to around the 15-s target and remained at that level throughout treatment. In the final session before a return to baseline, Millie's mother was introduced as the therapist ($M = 19$ s). A brief reversal to baseline resulted in IRTs of less than 15 s ($M = 8$ s). Following the reimplementation of treatment without prompts, the IRT increased to around the 15-s target ($M = 14.8$ s) and remained at that level throughout treatment. No instances of choking were observed during any phases of the procedure.

The number of blocked and allowed bites are depicted in the second panel of Figure 1. No attempts to take a bite were blocked during the baseline condition. When the DRL was initially implemented, a greater number of bites were blocked and a smaller number of bites were allowed.

The percentage of bite attempts reinforced during the DRL treatment is depicted in the third panel of Figure 1. When the DRL was initially implemented, a small percentage of bites was reinforced. Following implementation of the adjusting DRL, the percentage of reinforced bite attempts increased. In the final sessions, Millie almost never attempted a bite before the timer sounded.

The levels of negative side effects (SIB and tantrums) are depicted in the bottom panel of Figure 1. No SIB or tantrums were observed in the baseline condition. Following implementation of the treatment, SIB and tantrums increased but eventually decreased and remained low throughout the rest of the treatment, except for the first session in the fifth and the seventh phases. Thus, SIB and tantrums can be viewed as temporary negative side effects of the procedure.

## DISCUSSION

These procedures and results replicate those of Lennox et al. (1987). An adjusting DRL procedure was introduced, along with blocking and prompts. The DRL intervals were determined by calculating the average IRT from previous sessions. It was demonstrated that the treatment package was effective in increasing the IRTs between each attempted bite of food.

Lennox et al. (1987) reported the occurrence of negative side effects of the DRL procedure. In the current study, the treatment package also resulted in an increase in the levels of SIB and tantrums. However, the treatment continued despite these initial negative side effects, which eventually decreased. One explanation for the initial increase of negative side effects may be adventitious reinforcement (Skinner, 1948). That is, it is possible that the availability of food occurred in close temporal contiguity with instances of SIB or tantrums. When the relation between SIB or tantrums and food availability was disrupted, that is, when fewer contiguous pairings occurred, an extinc-

tion-like effect was observed. Another interpretation is that SIB and tantrums were extinction-induced phenomena—either emotional behavior or variations of behavior that produced access to food in the past (i.e., members of a food-reinforced response class).

A limitation of the study was that no measurement was taken on the amount of food on Millie's spoon. Although the IRTs between attempted bites of food increased, it is possible that Millie still engaged in dangerous eating rates by taking large bites. Anecdotally, we can report that this did not occur. A second limitation was that no attempt was made to compare fixed to adjusting DRL. Future researchers might directly compare these two approaches.

## REFERENCES

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